

in conjunction with top dressing. It also has potential uses during the propagation and liner production phases of woody plant production.

MY METHOD OF GROUND COVER PROPAGATION

BOB GRIMES

Warrior Nursery

Rt. 3, Box 782

Warrior, Alabama 35180

In propagating ground covers we are speaking of large quantities. In order to propagate these plants in quantity, plenty of "wood" is needed. Since all of our plants are either from vegetative propagation or division, we must have stock plant facilities.

Our stock plants are grown in 1-gal plastic containers, on approximately 1 A of treated ground covered with 1 to 2 inches of slag gravel, $\frac{1}{8}$ to $\frac{1}{4}$ inch in size. We use #25 impulse-type sprinklers on 30-ft centers with 160 lb city water pressure. This area is treated twice a year with Ronstar (oxadiazon, Rhone-Poulenc) at the recommended rate.

Our spraying program consists of Spectracide (diazinon, Ciba-Geigy) and Docide 101 (copper hydroxide, Kennecot Copper), alternating with Daconil 2787 (chlorothalonil, Diamond-Shamrock) and Orthene 75% WP (acephate, Chevron). We spray about every 30 days, using a 100 gal Mighty Mac trailer-type sprayer with 40 to 50 lb pressure.

In order to maintain weed-free plants we utilize Ronstar at manufacturer's recommended rates. Right after the containers are planted. Ronstar is broadcast over the entire container and plant pad. Application is repeated in late summer and early spring. Roundup (glyphosate, Monsanto) is used throughout the growing season when needed on areas adjacent to the growing pad but not on the container material. It is not necessary to spend any money for hand weeding when we follow this herbicide program.

During the growing season, usually from March through November, we fertilize with a dry top dress of 12-6-6 fertilizer that has been liquid coated with 1% Di-Syston (disulfoton, Mobay Chem.). We apply 1 teaspoon by hand to each container approximately every 60 days or more often during seasons of heavy rainfall, immediately after taking cuttings. Labor is paid for fertilizing on a piece-work basis.

We propagate 12 months out of the year; however, from June to September is our heaviest workload. We take cuttings approxi-

mately 4 inches in length. Cuttings of most cultivars are stuck in trays with the exact count per tray varying with the particular plant. For example, we put 100 English ivy per tray, 150 cotoneaster, and 80 juniper. We use cell packs consisting of 96 individual cells on creeping fig, azaleas, and creeping phlox. Somehow, with use, these just do better in the cell pack. We have a standing order with a West Coast nursery for 50 lb ivy per week. We know within 10 cuttings per week how many we will make. Since labor is paid by the piece, we have a very accurate way of determining our cost per plant.

At present we are predipping thrift, or creeping phlox, and juniper cuttings in a solution of WiltPruf, 1 tablespoon per gal of water. Our rooting hormone on everything is Chloromone (a plant extract, Chloromone Co.) using 1 part Chloromone to 3 parts water. Baby food jars make excellent containers for this solution. We use a rooting medium of $\frac{1}{2}$ fine bark and $\frac{1}{2}$ coarse perlite.

Once these cuttings are stuck, they are transported to mist houses on flat carriers made from worn out, discarded wheelbarrows. They are made to hold five flats, which are color-coded, since the people doing the sticking are on piece-work.

These trays are placed under 47% shaded quonset pipe houses with fine gravel floors. These houses have a 36 inch-side curtain that can be raised or lowered in order to have, or not to have, air draft. We find air is our best fungicide. Five-minute cycle timers active for 3 seconds are used until the first sign of roots appear. The cuttings are then placed on manually-controlled intervals. We use chlorinated city water, which has about 160 lbs pressure. This high pressure gives a very fine mist from the Flora-mist nozzles.

Some of these rooted cuttings are sold in trays, others are potted into 2 $\frac{1}{4}$ inch or 3 $\frac{1}{4}$ inch pots. As the potting cycle progresses, we shift 2 $\frac{1}{4}$ inch pots to gallons for future stock plants and finally the market. The houses hold 900 trays, and those used for ivy are filled and emptied 4 times a year.

A Bouldin-Lawson soil mixer utilizing a bi-level terrain situation works out well. The mixer is on one level, with the potting level 3 ft lower. Our soil mix consists of 3 parts pine bark, 1 part sand, and 1 part Birmingham slate. To each cubic yard we add 10 lb of Sta-Green Pro-Start and 10 lb of dolomite lime, along with 5 oz Banrot, and 5 oz of 10% chlordane. Pro-Start is a potting soil fertilizer mix containing gypsum, superphosphate, urea formaldehyde, potassium nitrate, and micronutrients.

By using a Bouldin-Lawson flat filler attached to the soil mixer on the upper level, we convert this to a 1-gallon can filler. The surplus soil is carried over to a spare potting bench by a

conveyor placed under the lip of the flat filler. We handle the potting setup with a work force of 5 people.

The potting operation takes place under a shed having two trailers located at right angles to the conveyor. When one trailer is filled and off to the field or shade house, the other trailer is in place, never leaving the potting crew without a place to set the freshly-planted containers. Here again, the potting crew are on piece-work.

As previously mentioned, the open field pads for gallon containers are treated with Ronstar. By broadcasting when the fresh containers are placed in growing position, the plants plus the area are treated in one operation. The quonset shade houses are handled in the same manner.

The houses are covered before winter with a single layer 4 mil plastic on top and sides. The exceptionally young liners are heated with gas-fired Modine heaters holding a 40°F temperature. During the winter we add middle benches to all liner houses. These are portable pipe benches made of metal tubing and prefabricated to fit in "boots" that also support the ground-bench side boards. This increases our space to one-third more and helps keep the houses warmer. The field container plants are winterized by placing them can-to-can.

Proper watering is the paramount duty of the entire operation. All water lines, regardless of whether using sprinklers or mist, are installed with 24-volt electric valves with a manual bypass for times when automatic control is not desired. I would like to point out that this is class II wiring and requires no electrical inspection.

The watering system for the 3¼ inch pots is a homemade device consisting of a plastic container from any discount store, a 24-volt heater transformer from any local supply house, several switches from Radio Shack and a lawn sprinkler control from W.W. Grainger. This control can be varied from 5 to 60 minutes. The importance of proper watering cannot be overemphasized.

In summary of our operation, please keep this in mind:

- A We are located within the city limits of a small town in North Alabama (zone 7-8). We operate on 2¼ A in a residential section, utilizing subdivision property that was rejected for residential dwellings. We are on city water.
- B. We employ no full time help, but hire mothers with school children and teen-age students on a part-time basis.
- C. 90% of our production is by piece-work.
- D. We determine our market before production of our plants. We believe it is not necessary to be big, but it is important

to be satisfied with your own operation and the plants you produce.

MY METHOD OF GROUND COVER PROPAGATION

REX MCDONALD

McDonald's Nursery

Route 1

Cameron, North Carolina 28326

McDonald's Nursery is located near Cameron, North Carolina, a small town in the central part of the state. It is in zone 8, which has an annual minimum temperature of 10 to 20°F and high temperatures of approximately 100°F. The nursery was started in 1972 as a wholesale operation specializing in groundcovers, and it is a little more than an acre in size.

In recent years, plants which could be used in special locations or to take the place of grass have been in demand due to a desire to reduce maintenance costs. Landscape architects are specifying groundcovers for problem areas such as banks, dense shade, or other unusual areas.

As the nursery is a small one and has no full time workers other than myself, any labor-saving techniques that can be used in a small scale operation must be used. Perhaps the best example of such a labor-saving device is a machine which cuts vine-like plants such as ivy and euonymus into cuttings of 3¼ inch long. This machine has 2 electric motors. One powers 11 saws spaced 3¼ inch apart at 10,000 rpm, and the second, a slow speed motor, turns 2 sets of belts in such a way that the plant material is slowly fed into the gang saws and the cuttings then dumped at the rear of the machine. This machine can make around 10,000 cuttings in about 15 minutes, provide the material has small stems and is fed into the machine rapidly. It is important that the material is fed into the machine so that it is perfectly straight and perpendicular to the saw. This machine was developed by Ernest Cuzzocreo of Orange, Connecticut, in cooperation with the University of Connecticut.

Another labor-saving technique that was recently started here is to market plants as rooted cuttings, bare-root, or as divisions instead of attempting to pot each plant in an individual pot as was practiced until last year. These practices allow more plants to be produced in a shorter time and in a smaller area. Since an established root system is preferred by some landscapers, many plants must still be produced in individual pots